FIELD CONTROL IN PERMANENT MAGNET MACHINCE

B

C

ABSTRACT OF THE DISCLOSURE

A multi-pole rotor of an electric machine includes ferromagnetic pole segments each extending from an inner surface of the rotor to an outer surface of the rotor, slots separating each of said ferromagnetic pole segments, each of said slots extending from the inner surface of the rotor to the outer surface of the rotor, and each of said slots also having a width varying along a direction from the inner surface of the rotor to the outer surface of the rotor, and a magnet structure constructed and arranged within each of said slots such that said magnet structure also has a width varying along the direction from the inner surface of the rotor to the outer surface of the rotor.

MEANS FOR FIELD CONTROL IN PERMANENT MAGNET ELECTRIC MACHINES

Abstract

The present invention is a rotor apparatus in which the shape and magnitude of magnetic field distribution along the rotor circumference are controlled by means of current(s). The control current(s) can flow only during the phase in which a new magnetic state is created, or permanently. When the rotor magnetization is controlled by additional stator currents, the stator of the proposed machine draws during regular run only the load current. In one embodiment, the rotor of a synchronous machine has iron pole segment (1) and two or more tangentially magnetized permanent magnets (2), (3) per pole with different radial dimensions. On the stator side a conventional AC winding carries stator currents during normal operation. During a short remagnetization phase, an additional component of stator current provides for change of magnetization direction in a portion of longer magnets.